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10/808,081	03/24/2004	Matthew D. Whitton	GP-303000	5371

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CHRISTOPHER DEVRIES
General Motors Corporation
Legal Staff, Mail Code 482-C23-B21
P.O. Box 300
Detroit, MI 48265-3000

EXAMINER	
JEN, MINGJEN	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/808,081	Applicant(s) WHITTTON, MATTHEW D.	
	Examiner Ian Jen	Art Unit 3609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03/24/04*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/24/2004*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipate by Minowa et al (US Pat No. 6243637).**

As for claim 1, Minowa et al shows a method for use with an automatic transmission having an off-going clutch and an on-coming clutch during a speed ratio shift event(Abstract), the method comprising: controlling the off-going clutch using closed loop control to maintain a predetermined slip threshold (Column, lines 59-63 where slip range is confined by turbine torque, oil pressure: Column 3, lines 25-30; Column 6 , lines 66-Column 7, lines 30), controlling the off-going clutch including generating an off-going clutch pressure command to which the off-going clutch is responsive and that varies with respect to time (Fig 12, Column 2, lines 1-15; Column 2, lines 64-Column 3, lines 8; Column 6, lines 32 -35; causing the on-coming clutch to gain torque capacity during said controlling the off-going clutch (Fig 7: Column 2, lines 1-15; Column 2 , lines 64 -Column 3, lines 8; Column 5, lines 35 -40) determining the first derivative with respect to time of at least a portion of the off-going clutch pressure command (Column 9 ,lines 55 - Column 10, lines 40);

and determining when the on-coming clutch gained torque capacity using the first derivative (Column 9, lines 55- Column 10, lines 40).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 2 rejected under 35 U.S.C. 103(a) as being unpatentable over Minowa et al (US Pat No. 6243637) in view of Vilim et al (US Pat No. 5745382).

As for claim 2, Minowa et al shows the method of determining when the on-coming clutch gained torque capacity (Fig 7; Column 5, lines 35 -40). However, it does not show the method using a neural network method. Vilim et al shows a neural network for teaching industrial device (Fig 2, Column 3, lines 40-Column 4, lines 37; Column 2, lines 1-15; Column 2, lines 64-Column 3, lines 8). It would have been obvious for one of ordinary skill in the art to provide a neural network method to Minowa et al, as taught by Vilim et al, for the purpose of providing automated teaching model for complex dynamic system.

5. Claim 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minowa et al (US Pat No. 6243637) in view of Vilim et al (US Pat No. 5745382) and further in view of Narita (US Pat No. 5241477).

As for claim 3, Minowa et al shows all the method and step as indicated above. However, it does not shows the first derivative is characterized by local minima and maxima, and wherein said determining when the on-coming clutch gained torque capacity includes generating a set of data points, each of the data points including a time value and a first derivative value of one of the local minima or maxima.

Narita shows the first derivative is characterized by local minima and maxima and determining when the on-coming clutch gain torque capacity (Fig 11, Column 3, lines 60 - Column 4, lines 25; Column 9, lines 53-64); generating a set of data points, each of the data points including a time value and a first derivative value of one of the local minima or maxima (Column 7, lines 5-10 where the data points are plotted with respect to recorded time in Fig 11; Column 2, lines 14-15). It would have been obvious for one of ordinary skill in the art to provide a first derivative technique to measure local maxima and minima to Minowa et al, as taught by Narita, since first derivative is the rate of change provides measure to torque peak or torque down by local maxima and minima.

As for claim 4, Minowa et al modified method shows all the method and step as indicated above. However, it does not show the method further comprising classifying each of the data points into one of a first group and a second group using a k-means algorithm, the data points in the second

group having later time values than the data points in the first group; and determining the data point having the earliest time value in the second group.

Vilim et al shows the method further comprising classify each of the data point into one of a first group and a second groups using a known k -means algorithm(Column 5, lines 49-65; Column 7 ,liens 43-Column 8, lines 15), the data point in the second group having later time values than the data pint in the first group and determining the data point having the earliest time value in the second groups(fig 4A, Fig 4B; Column 9, lines 1- Column 10, lines 15 where Class II data point have later time values and Class II data point starts at 0 sec, which is the earliest time value). It would have been obvious for one of ordinary skill in the art to provide a commonly well known k means algorithm by clustering data into different groups with respect to different time to Minowa et al, as taught by Vilim et al, for the purpose of providing a well known data point classifying means for neural network controls.

As for claim 5, Narita shows the on-coming clutch includes an apply chamber, wherein the on-coming clutch is hydraulically actuated by filling the apply chamber with fluid, (Column 3, lines 1-15), causing the on-coming clutch to gain torque capacity includes supplying fluid to the apply chamber (Column 3, lines 1 -15; Column 3, lines 60- Column 4, lines 15; Column 10, lines 35 -43 where the fluid pressure is the driving mean for clutch and the clutch gains the torque capacity by the control of fluid pressure), and wherein the method further includes determining a measure of the total volume of fluid supplied to the apply chamber at the time value of the data point having the earliest time value in the second group (Fig 11, Column 3, lines 40-57 where total fluid volume is measure in fluid pressure density at the earliest time value in the second group starts at 0 sec). It

would have obvious for one of ordinary skill in the art to provide the automatic transmission system of Minowa et al with hydraulically actuated chamber along with volume measurement associated with time value for the purpose of controlling the actuation of hydraulic clutch, as taught by Narita.

6. Claim 6, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minowa et al (US Pat No. 6243637) in view of Narita (US Pat No. 5241477).

As for claim 6, Minowa et al shows a control apparatus for an automatic transmission having an input shaft and an output shaft (Fig 13, input shaft 18, output shaft 24 ; Column 4, lines 46-67); a first clutch and a second clutch (Abstract, Column 5, lines 53-55); first clutch and the second clutch are operatively connected between the input shaft and the output shaft to effect a speed ratio change during a shift event by disengagement of the first clutch and engagement of the second clutch (Column 4, lines 46- Column 5, lines 3).

Minowa et al does not show a first and second fill chamber to which hydraulic fluid is supplied for hydraulic actuation of the first and second clutch, respectively; a first and second actuator configured to selectively allow pressurized fluid into the first and second fill chamber, respectively. A controller operatively connected to the first actuator and the second actuator to cause selective disengagement and engagement of the first and second clutches, respectively. The controller is programmed and configured to determine the speed ratio between the input shaft and the output shaft in order to determine the existence of a predetermined slip threshold at the first clutch; wherein the controller is programmed and configured to control the off-going clutch during the shift event using closed loop control to maintain the predetermined slip threshold by generating

an off-going clutch pressure command to which the first clutch is responsive and that varies with respect to time; wherein the controller is programmed and configured to cause the on-coming clutch to gain torque capacity during the shift event; wherein the controller is programmed and configured to determine the first derivative with respect to time of at least a portion of the off-going clutch pressure command; and wherein the controller is programmed and configured to determine when the on-coming clutch gained torque capacity using the first derivative.

Narita shows a first and second fill chamber to which hydraulic fluid is supplied for hydraulic actuation of the first and second clutch, respectively (Column 3, lines 1-15; Column 3, lines 60- Column 4, lines 15; Column 10, lines 35 -43); a first and second actuator configured to selectively allow pressurized fluid into the first and second fill chamber,. respectively (Column 3, lines 1-15; Column 3, lines 60- Column 4, lines 15; Column 10, lines 35 -43); The control apparatus comprising : a controller operatively connected to the first actuator and the second actuator to cause selective disengagement and engagement of the first and second clutches, respectively (Column 5, line s4 -14; Column 8, lines 30-35). The controller is programmed and configured to determine the speed ratio between the input shaft and the output shaft in order to determine the existence of a predetermined slip threshold at the first clutch (Column 8, line s56 - Column 9, lines 20); wherein the controller is programmed and configured to control the off-going clutch during the shift event using closed loop control to maintain the predetermined slip threshold by generating an off-going clutch pressure command to which the first clutch is responsive and that varies with respect to time (Fig 12, Column 2, lines 1 -15; Column 2, line s64 - Column 3, lines 8; Column 6, lines 32-35; Fig 10, Column 9, lines 55- Column 10, lines 40); wherein the controller is programmed and configured to cause the on-coming clutch to gain torque capacity during the shift event (Fig 7, Column 5, lines

35 -40); wherein the controller is programmed and configured to determine the first derivative with respect to time of at least a portion of the off-going clutch pressure command (Column 9 ,lines 55 - Column 10, lines 40); and wherein the controller is programmed and configured to determine when the on-coming clutch gained torque capacity using the first derivative (Column 9, lines 55- Column 10, lines 40). It would have been obvious for one of ordinarily skill in the art to provide the automatic transmission system of Minowa et al with the control command, as taught by Narita, because the use of speed ratio from input and output shaft with respect to slip threshold and the derivative with respect to fluid for determining the clutch engage and disengage and the use of the closed loop feedback control system utilizing computer program is well commonly known in the art.

As for claim 11, Minowa et al shows a method for use with an automatic transmission having an off-going clutch and an on-coming clutch during a speed ratio shift event (abstract), the on-coming clutch being characterized by hydraulic actuation when an apply chamber is filled with sufficiently pressurized fluid, the method comprising: controlling the off-going clutch using closed loop control to maintain a predetermined slip threshold (Column 2, lines 59-63 where slip is controlled by turbine torque, oil pressure; Column 3, lines 25-30; Column 6, lines 66- Column 7, lines 30), controlling the off-going clutch including generating an off-going clutch pressure command to which the off-going clutch is responsive and that varies with respect to time (Fig 12, Column 2, lines 1-15; Column 2, lines 64- Column 3, lines 8; Column 6, lines 32-35); causing the on-coming clutch to gain torque capacity by supplying fluid to the apply chamber during said controlling the off-going clutch (Fig 7; Column 5, lines 35-40); determining the first derivative with

respect to time of at least a portion of the off-going clutch pressure command (Column 9, lines 55- Column 10, lines 40),

Minowa et al does not show first derivative being characterized by local minima and maxima; generating a set of data points, each of the data points including a time value and a first derivative value of one of the local minima or maxima; classifying each of the data points into one of a first group and a second group using a k-means algorithm, the data points in the second group having later time values than the data points in the first group; determining the data point having the earliest time value in the second group; and determining a measure of the total volume of fluid supplied to the apply chamber at the data point having the earliest time value in the second group.

Narita shows first derivative being characterized by local minima and maxima (Column 7, lines 5-10 where the data points are plotted with respect to recorded time in Fig 11; Column 2, lines 14-15); generating a set of data points, each of the data points including a time value and a first derivative value of one of the local minima or maxima (Column 7, lines 5-10 where the data points are plotted with respect to recorded time in Fig 11; Column 2, lines 14-15);
Vilim et al shows classifying each of the data points into one of a first group and a second group using a k-means algorithm (Column 5, lines 49-65; Column 7, lines 43- Column 8, lines 15), the data points in the second group having later time values than the data points in the first group (Fig 4, Column 9, lines 1- Column 10, lines 15); determining the data point having the earliest time value in the second group; and determining a measure of the total volume of fluid supplied to the apply chamber at the data point having the earliest time value in the second group (Fig 11, Column 3, lines 40-57). It would have been obvious for one of ordinary skill in the art to provide a first

derivative technique to measure local maxima and minima to Minowa et al, as taught by Narita, since first derivative provides torque peak or down by local maxima and minima as the rate of change. Furthermore, it would have been obvious for one of ordinary skill in the art to provide K means algorithm by clustering data into different groups with respect to different time to Minowa et al, as taught by Vilim et al, for the purpose of providing well known data point classifying means for neural network controls.

7. Claim 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minowa et al (US Pat No. 6243637) in view of Narita (US Pat No. 5241477) and further in view of Vilim et al (US Pat No. 5745382)

As for claim 7, Minowa et al shows the control apparatus wherein the controller is programmed and determine when the on-coming clutch gained torque capacity using the first derivative (Column 9, lines 55- Column 10, lines 40). However, it does not shows the method using a neural network method in the controller. Vilim et al shows a neural network method for teaching industrial device (Fig 2, Column 3, lines 40-Column 4, lines 37; Column 2, lines 1-15; Column 2, lines 64-Column 3, lines 8). It would have been obvious for one of ordinary skill in the art to provide a neural network method to Minowa et al, as taught by Vilim et al, for the purpose of providing automated teaching model for complex dynamic system

As for claim 8, Minowa et al does not show the control apparatus wherein the first derivative is characterized by local minima and maxima , and the controller is programmed and configured to

generate a set of data points, each of the data points including a time value and a first derivative value of one of the local minima or maxima.

Narita shows the control apparatus wherein the first derivative is characterized by local minima and maxima(Fig 11, Column 3, line s60- Column 4, lines 25; Column 9, lines 53-64), and wherein the controller is programmed and configured to generate a set of data points (Column 7, lines 5-10 where the data points are plotted with respect to recorded time; Column 2, lines 14-15), each of the data points including a time value and a first derivative value of one of the local minima or maxima(Column 7, lines 5-10 where the data points are plotted with respect to recorded time in Fig 11; Column 2, lines 14-15). It would have been obvious for one of ordinary skill in the art to provide a commonly well known first derivative technique to measure local maxima and minima to Minowa et al, as taught by Narita, since first derivative is used as rate of change information to provides torque peak or down by local maxima and minima.

As for claim 9, Minowa et al does not show the control apparatus where the controller is programmed and configured to classify each of the data points into one of a first group and a second group using a k-means algorithm, the data points in the second group having later time values than the data points in the first group, and wherein the controller is programmed and configured to determine the data point having the earliest time value in the second group.

Vilim et al shows the control apparatus where the controller is programmed and configured to classify each of the data points into one of a first group and a second group using a known k-means algorithm(Column 5, lines 49-65; Column 7, lines 43 - Column 8, lines 15), the data points in the second group having later time values than the data points in the first group, and wherein the

controller is programmed and configured to determine the data point having the earliest time value in the second group(Fig 4A, Fig 4B; Column 9 ,lines 1- Column 10, lines 15 where class II data point have later time values and Class II data point state at 0 Sec, which is the earliest time value). It would have been obvious for one of ordinary skill in the art to provide a commonly well know k means algorithm by clustering data into different groups with respect to different time to Minowa et al modified apparatus, for the purpose of providing a well known data point classifying means for neural network controls.

As for claim 10, Minowa et al does not show the controller being programmed and configured to determine a measure of the total volume of fluid supplied to the apply chamber at the data point having the earliest time value in the second group.

Narita shows the control apparatus where the controller being programmed and configured to determine a measure of the total volume of fluid supplied to the apply chamber at the data point having the earliest time value in the second group (Fig 11, Column 3, lines 40-57; Column 3, lines 1-15; Column 3, lines 60-Column 4, lines 15; Column 10, lines 34-43). It would have been obvious for one of ordinary skill in the art to provide the automatic transmission system of Minowa et al with the measurement of total volume of fluid of Narita associated with time value for the purpose of controlling the actuation of hydraulic clutch, as taught by Narita.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Soliman et al (US Pat No 6961646) shows a automatic control system with clutch and closed loop control.

Goebel et al (US Pat No 6216066) shows data classification use k-means.

Yuasa et al (US Pat No 6428440) shows a closed loop control system for transmission by derivative and gear ratio.

Yuasa et al (US Pat Pub No 2001/0016539) shows a closed loop control system for transmission by fluid pressure and gear ratio.

Minowa et al (US Pat No 5779594) shows a closed loop control system with computer controller and derivative.

Kubo et al (US Pat No 6503165) shows a hydraulic control system for transmission using derivative.

Ochi et al (US Pat No 6334833) shows a control apparatus for transmission using actuator and torque.

Narita al (US Pat No 5304102) shows a control system for transmission using gear ratio and torque.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ian Jen whose telephone number is 571-270-3274. The examiner can normally be reached on Monday - Friday 8:00-5:00 (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven McAllister can be reached on 571-272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ian Jen 8/16 - 2007

Ian Jen

MATTHEW S. GART
PRIMARY EXAMINER
TECHNOLOGY CENTER 3600